None of the proposed amendments adds new matter to the original disclosure.

Having regard to the rejection of original claims 1 - 6 and 8 as being allegedly anticipated by Lanzerotti et al. (IEEE), Applicants have redefined their invention by adding to the limitations contained in their original claim 1 the fact that the product of the germanium concentration in the base layer from the collector layer to the emitter layer is in the range from 50 atomic % C nm to *less than* 1500 atomic % C nm. This clearly and patentably distinguishes from the teaching of Lanzerotti et al. where according to page 334, right column, second paragraph, the product of the base layer thickness between the collector and the emitter and of the germanium concentration in the base layer amounts to not less than 1,500 atom % C nm. In Lanzerotti et al. the thickness of the base layer between collector and emitter amounts to 60 nm consisting of a total of three layers, viz. a doped internal layer of 46 nm thickness and two "spacer" layers each 7 nm thick respectively facing the collector and the emitter Lanzerotti et al.

Furthermore, in Lanzerotti the Ge concentration in the base layer and the two spacer layers is uniformly 25 atom %. Multiplying this by the mentioned actual or true overall thickness results in 1,500 atom % C nm. This, then, distinguishes clearly from the value between and less than 1,500 atom % C nm of Applicants' new generic claim.

At page 249, right column, last paragraph, Lanzerotti et al. disclose two different transistors with Ge concentration values between 4,000 and 6,000 atom % C nm as derived from the product of the thickness of the base layer between emitter and collector and the Ge concentration of the base layer. The thickness of the base layer of the two described transistors is 10 nm; the thickness of the

"spacers" of one transistor is 5 nm each and 10 nm each in the other transistor. Accordingly, the overall thickness of the base layers of the two transistors is thus 20 nm and 30 nm. This in either transistor yields a concentration of 20 atom % C nm or, the products of 4,000 and 6,000 atom % C nm.

While in view of Applicants' newly presented claims 14-22 the rejection of examined claims 7 and 9-13 on grounds of alleged obviousness in view of a combination of the two Lanzerotti et al. references and Hashimoto et al., U.S. patent 5,557,118, is believed to be moot, Applicant wish to point out, with respect, that their invention distinguishes patentably over those three references, taken singly or in combination. For '118 transistor differs from Applicants' transistor in at least two structural respects: 1) The emitter of the '118 patent consists of SiC as distinguished from Applicants' silicon emitter; and 2), Applicants do not provide for an intermediate layer between their base layer and their emitter. Nothing can be said about either the Ge concentration in the base layer or the product of the Ge concentration of the base and the thickness thereof between collector and emitter.

It is respectfully urged that Applicants' hetero bipolar transistor provides for what may conveniently be termed an especially high maximum oscillation frequency as a result of the product of the germanium concentration in the base layer and the width of the base layer from the collector layer to the emitter layer being in the range of 50 atomic % C nm to less than 1500 atomic % C nm. Nothing in Lanzerotti et al. (IEEE) relates to anything similar. Indeed, a skilled artisan could only conclude, from studying Lanzerotti et al. that high frequency SiGe hetero bipolar transistors are the result of a double mesa process, i.e., a particular kind of process operation with etching steps being of particular significance. Nothing can be learnt from Lanzerotti et al. about changing

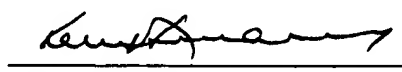
manufacturing parameters such that the product of the Ge concentration in the base and of the base is reduced.

Neither is there anything in the IEDM paper of Lanzerotti et al. which would be of any value to a skilled artisan seeking a novel high frequency SiGe HBT. It only teaches particularly high boron doping levels of the base adjacent the base emitter interface for purposes of attaining high frequency properties. Nothing, however, could reasonably be said to teach anything about favorable results obtained by the GE concentration product repeatedly referred to above.

There is simply nothing in the '118 patent which would in anyway supplement the teaching of Lanzerotti et al. such that a person skilled in the art would, without inventive ingenuity, conclude that affecting the germanium concentration would lead to desirable and perhaps superior high frequency properties in a SiGe HBT.

It is respectfully urged that as hereby amended, Applicants' invention is both new and unobvious over the prior art of record. Allowance of the instant application is thus indicated and is earnestly solicited.

Respectfully submitted,



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